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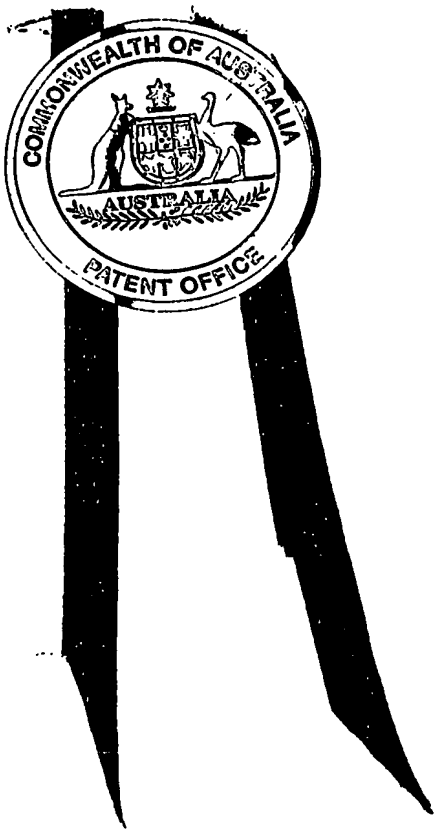

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NUMBER:

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PROVISIONAL SPECIFICATION FOR THE INVENTION ENTITLED

"TREATMENT OF CHLORAMINATED WATER"

The present invention will be described in the following statement:

The present invention relates to a method of treating chloraminated water.

It is known to treat reticulated water with chlorine and ammonia in order to produce monochloramine according to the following reactions.

$$Cl_2 + H_2O \leftrightharpoons HOCl + HCl$$

$$NH_3 + HOCL \leftrightharpoons NH_2Cl + H_2O$$

Monochloramine is used as a disinfectant within the water. Typically the above reactions take place in the presence of excess ammonia, for instance in a concentration of about 0.2mg/L.

One problem which arises in the use of chloramines in water is that the chloramines have a propensity to decay. Tests have revealed this decay to be largely due to nitrification of ammonia, causing the equilibrium equations above to move to the left. Nitrification occurs when ammonia is oxidised to nitrite by microbiological organisms, either within the water or on an inner surface of pipes. The nitrite is then further oxidised to nitrate by other organisms.

Various methods have been proposed in order to ameliorate this problem. They include the addition of chlorite ions, a significant pH increase or changing to free chlorination. None of these solutions have thus far proved satisfactory.

Consequently, it is currently necessary to retreat water being reticulated over long distances at various stages along the reticulation path. This requires the addition of further chlorine and/or ammonia to bring the amount of chloramines or chlorine in the water back to required levels.

The present invention attempts to overcome at least in part some of the aforementioned propensity of chloramines in treated water to decay.

In accordance with one aspect of the present invention there is provided a method of treating water containing chloramines as a disinfectant, the method comprising the step of adding copper ions to the water. Advantageously, the copper restricts microbial growth in the water, whilst being held in solution by complexing with ammonia.

The present invention will now be described.

Copper ions are used to control and eliminate a number of microorganisms in water. Previously, it has only been possible to use copper ions in localised environments such as for the control of algae in reservoirs and swimming pools.

Copper ions are not used for the treatment of reticulated drinking water as copper precipitates from water.

The present invention relies on the combination of ammonia, chlorine and copper ions within reticulated water. The three substances interrelate to provide a useful result.

The ammonia and chlorine combine with the water as per the above equation to produce monochloramine. The monochloramine acts to disinfect the water.

The copper ions act to restrict microbial growth in the water and in pipes. This in turn reduces the nitrification of the ammonia.

The copper ions combine with the ammonia to form complex ions. This has the effect of maintaining the copper in solution, and restricts the propensity for the copper to precipitate out of the water as copper hydroxide.

The combined effect of the chemical combination is that required monochloramine and ammonia levels can be maintained in reticulated water supplies for considerably longer periods, and over larger distances through water reticulation systems.

In one example of the present invention, copper was provided to chloraminated water in the form of copper sulphate. The copper was provided at a concentration of 0.2mg/L. The presence of copper at this concentration substantially reduced the rate of nitrification of the ammonia.

Current research indicates that concentration of copper in the range of 0.1 to 0.5 mg/L will be complexed by the ammonia present in the water, and will successfully reduce the effects of nitrification.

In another embodiment of the invention, a lower dosage of copper is applied to the water together with other metals such as zinc, silver or tin.

Modifications and variations as would be apparent to a skilled addressee are deemed to be within the scope of the present invention.

DATED THIS 25th DAY OF JULY 2003.

WATER CORPORATION
By their Patent Attorneys
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